

ABSTRACT

Microcellular polyhipe polymer scaffold suitable for growth of living matter for biomedical applications, obtainable by polymerising a high internal phase emulsion, comprising a homogeneous cross linked open cellular material defined by a bulk polymer matrix having a surface and an interface with an internal phase, and having porosity greater than 75% comprising emulsion derived pores of diameter in the range of 0.1 to 10,000 micron and emulsion derived pore interconnects of diameter in the range of up to 100 micron, wherein the scaffold comprises a plurality of discrete and/or interpenetrating zones:

at the polymer surface;

within its bulk matrix;

at the interface between polymer and internal phase; and/or

between adjacent but distinct pores and/or interconnects,

characterised by form and dimension of pore and interconnect type within each zone, and location of zones wherein adjacent or interpenetrating zones are distinguished by boundaries which may be between or contained within adjacent pores and/or interconnects in respective zones, whereby zones are suitable for regulating positioning and/or morphology of living matter;

a biologically active system, or organ support module comprising the scaffold and methods and processes for preparation thereof and use thereof.